

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A facial image recognition apparatus comprising[[:]]; a plurality of ~~illuminations radiating light toward the face of a human recognition object~~ illumination units each of which radiates light from a different direction toward the entire face of a human recognition object,

a motion picture camera for photographing which photographs a facial image of the human recognition object toward which the light from the plurality of ~~illuminations~~ illumination units is radiated,

a feature value extraction section ~~for extracting which extracts~~ a feature value of the face of the human recognition object from a facial image photographed by the motion picture camera, and

a recognition section ~~for collating which collates~~ the feature value extracted by the feature value extraction section with a standard feature value registered in advance so as to recognize a facial image of the human recognition object.

2. (Canceled).

3. (Currently Amended) The facial image recognition apparatus as set forth in claim [2] 1, said plurality of illumination units including a first illumination unit which illuminates light toward the entire face of the human recognition object and a second illumination unit which illuminates light toward the entire face of the human recognition object from a direction different from a direction from which the first illumination unit radiates light, wherein the illuminance of the light radiated from the first illumination unit is greater than that of the light radiated from the second illumination unit.

4. (Currently Amended) The facial image recognition apparatus as set forth in claim [2] 1, said plurality of illumination units including a first illumination unit which illuminates light toward the entire face of the human recognition object and a second illumination unit which illuminates light toward the entire face of the human recognition

object from a direction different from a direction from which the first illumination unit radiates light, wherein the total value of the illuminance of the light radiated from the first illumination unit and the illuminance of the light radiated from the second illumination unit is greater than the illuminance of the light other than the light from the first and second [~~illuminations~~] illumination units radiated to the human recognition object.

5. (Currently Amended) The facial image recognition apparatus as set forth in claim 1, further comprising an information input section ~~for inputting~~ which inputs information related to the human recognition object, wherein the recognition section searches a feature value corresponding to the information inputted by the information input section from the standard feature value registered in advance and collates the searched feature value with the feature value extracted by the feature value extraction section so as to recognize a facial image of the human recognition object.

6. (Currently Amended) The facial image recognition apparatus as set forth in claim 1, further comprising an outer light interruption section ~~for interrupting~~ which inputs light other than the light from the plurality of illuminations radiated to a facial part of the human recognition object.

7. (Currently Amended) The facial image recognition apparatus as set forth in claim 1, further comprising a display section ~~for displaying~~ which displays the facial image photographed by the motion picture camera and displaying information showing an appropriate size of a facial image.

8. (Currently Amended) The facial image recognition apparatus as set forth in claim [2] 1, said plurality of illumination units including a first illumination unit which illuminates light toward the entire face of the human recognition object and a second illumination unit which illuminates light toward the entire face of the human recognition object from a direction different from a direction from which the first illumination unit radiates light, wherein

the first illumination unit is installed in a front right diagonal part or a front left diagonal part of the motion picture camera, taken in the direction that the human recognition object looks, and

the motion picture camera is installed below a position of the face of the human recognition object so as to photograph a facial image of the human recognition object in an upward direction.

9. (Currently Amended) The facial image recognition apparatus as set forth in claim 1, wherein

the plurality of ~~illuminations~~ illumination units sequentially operate in a predetermined order and time interval,

the motion picture camera photographs facial images of the human recognition object one after another by synchronizing sequential operations of the plurality of ~~illuminations~~ illumination units,

the feature value extraction section extracts feature values of the face of the human recognition object from a plurality of facial images sequentially inputted from the motion picture camera, respectively, and

the recognition section collates a plurality of feature values extracted by the feature value extraction section with a standard feature value registered in advance, respectively, so as to recognize a facial image of the human recognition object.

10. (Currently Amended) The facial image recognition apparatus as set forth in claim 9, further comprising a registration section ~~for registering~~ configured to register the plurality of feature values extracted by the feature value extraction section as standard feature values, respectively, at a time of registration of a facial image, wherein the recognition section collates a plurality of feature values extracted by the feature value extraction section with a plurality of standard feature values registered by the registration section, respectively, at a time of collation of a facial image, so as to recognize a facial image of the human recognition object.

11. (Currently Amended) A facial image recognition apparatus comprising a facial image registration section for performing registration processing of a facial image and a facial image recognition section connected to the facial image registration section to perform recognition processing of a facial image, wherein

the facial image registration section comprises a plurality of ~~illuminations radiating light toward the face of a human recognition object~~ first illumination units each of which radiates light from a different direction toward the entire face of a human recognition object,

a first motion picture camera for photographing a facial image of the human registration object, a first feature value extraction section for extracting a feature value of the face of the human registration object from a facial image photographed by the first motion picture camera, and a memory section for storing a feature value extracted by the first feature value extraction section as a standard feature value, and

the facial image recognition section comprises a plurality of ~~second illuminations radiating light toward the face of a human recognition object~~ second illumination units each of which radiates light from a different direction toward the entire face of the human recognition object, a second motion picture camera ~~for photographing~~ which photographs a facial image of the human recognition object, a second feature value extraction section ~~for extracting which extracts~~ a feature value of the face of the human recognition object from a facial image photographed by the second motion picture camera, and a recognition section ~~for collating which collates~~ a feature value extracted by the second feature value extraction section with a feature value stored in the memory section of the facial image registration section so as to recognize a facial image of the human recognition object.

12. (Currently Amended) The facial image recognition apparatus as set forth in claim 11, wherein

the facial image registration section further comprises a first display section ~~for displaying~~ a facial image photographed by the first motion picture camera, and

the facial image recognition section further comprises a second display section ~~for displaying~~ a facial image photographed by the second motion picture camera.

13. (Withdrawn) A pass control apparatus recognizing a facial image of a passenger to control a pass of the passenger, said pass control apparatus comprising
a plurality of illuminations radiating light toward the face of the passenger,
a camera for photographing a facial image of the passenger toward which the light from the plurality of illuminations is radiated,

a feature value extraction section for extracting a feature value of the face of the passenger from a facial image photographed by the camera,

a recognition section for collating the feature value extracted by the feature value extraction section with a standard feature value registered in advance so as to recognize a facial image of the passenger, and

a pass control section for controlling a pass of the passenger according to a recognition result by the recognition section.

14. (Withdrawn) The pass control apparatus as set forth in claim 13, wherein the plurality of illuminations are composed of a first illumination for radiating light toward the face of the passenger and a second illumination for radiating light toward the face of the passenger, said first illumination is installed in an upper right diagonal part, an upper left diagonal part, a front right diagonal part, or a front left diagonal part of the camera, taken in the direction that the passenger looks, and said second illumination is installed below the camera.

15. (Withdrawn) The pass control apparatus as set forth in claim 13, further comprising an information input section for inputting information related to the human recognition object, wherein the recognition section searches a feature value corresponding to the information inputted by the information input section from the standard feature value registered in advance and collates the searched feature value with the feature value extracted by the feature value extraction section so as to recognize a facial image of the human recognition object.

16. (Withdrawn) The pass control apparatus as set forth in claim 13, further comprising an outer light interruption section for interrupting light other than the light from the plurality of illuminations radiated to a facial part of the passenger.

17. (Withdrawn) The pass control apparatus as set forth in claim 13, further comprising a display section for displaying the facial image photographed by the camera and displaying information showing an appropriate size of a facial image.

18. (Withdrawn) The pass control apparatus as set forth in claim 14, wherein the first illumination is installed in a front right diagonal part or a front left diagonal part of the camera, taken in the direction that the human recognition object looks, and the camera is installed below a position of the face of the human recognition object so as to photograph a facial image of the human recognition object in an upward direction.

19. (Withdrawn) The pass control apparatus as set forth in claim 13, wherein the plurality of illuminations sequentially operate in a predetermined order and time interval,

the camera photographs facial images of the passenger one after another by synchronizing sequential operations of the plurality of illuminations,

the feature value extraction section extracts feature values of the face of the passenger from a plurality of facial images sequentially inputted from the camera, respectively, and

the recognition section collates a plurality of feature values extracted by the feature value extraction section with a standard feature value registered in advance, respectively, so as to recognize a facial image of the passenger.

20. (Withdrawn) The pass control apparatus as set forth in claim 19, further comprising a registration section for registering the plurality of feature values extracted by the feature value extraction section as standard feature values, respectively, at a time of registration of a facial image, wherein the recognition section collates a plurality of feature values extracted by the feature value extraction section with a plurality of standard feature values registered by the registration section, respectively, at a time of collation of a facial image, so as to recognize a facial image of the passenger.

21. (Withdrawn) A pass control apparatus recognizing a facial image of a passenger to control a pass of the passenger, said pass control apparatus comprising a facial image registration section for performing registration processing of a facial image and a facial image recognition section connected to the facial image registration section to perform recognition processing of a facial image, wherein

the facial image registration section comprises a plurality of first illuminations radiating light toward the face of a human registration object, a first camera for photographing a facial image of the human registration object, a first feature value extraction section for extracting a feature value of the face of the human registration object from a facial image photographed by the first camera, and a memory section for storing a feature value extracted by the first feature value extraction section as a standard feature value, and

the facial image recognition section comprises a plurality of second illuminations radiating light toward the face of the passenger, a second camera for photographing a facial image of the passenger, a second feature value extraction section for extracting a feature value of the face of the passenger from a facial image photographed by the second camera, a

recognition section for collating a feature value extracted by the second feature value extraction section with a feature value stored in the memory section of the facial image registration section so as to recognize a facial image of the passenger, and a pass control section for controlling a pass of the passenger according to a recognition result by the recognition section.

22. (Withdrawn) The pass control apparatus as set forth in claim 21, wherein the facial image registration section further comprises a first display section for displaying a facial image photographed by the first camera, and the facial image recognition section further comprises a second display section for displaying a facial image photographed by the second camera.

23. (Withdrawn) The pass control apparatus as set forth in claim 13, further comprising a record device for recording an image photographed by the camera.

24. (Withdrawn) The pass control apparatus as set forth in claim 23, wherein the recognition section sends a recognition result to the record device, and the record device records a recognition result by the recognition section along with an image photographed by the camera.

25. (Withdrawn) The pass control apparatus as set forth in claim 13, further comprising an image transfer section for transferring an image photographed by the camera to a display device for monitoring.

26. (Currently Amended) A facial image recognition apparatus comprising a motion picture camera installed so that a human recognition object positions oneself on a floor face having at least one or more differences in elevation and photographing a facial image of the human recognition object positioning oneself on a floor face of a height according to the height of the human recognition object,

a display section ~~for displaying~~ which displays a facial image of the human recognition object photographed by the motion picture camera,

a feature value extraction section ~~for extracting~~ which extracts a feature value of the face of the human recognition object from a facial image photographed by the motion picture camera, and

a recognition section ~~for collating~~ which collates the feature value extracted by the feature value extraction section with a standard feature value registered in advance so as to recognize a facial image of the human recognition object.

27. (Currently Amended) The facial image recognition apparatus as set forth in claim 26, further comprising an information input section ~~for inputting~~ which inputs information related to the human recognition object, wherein the recognition section searches a feature value corresponding to the information inputted by the information input section from the standard feature value registered in advance and collates the searched feature value with the feature value extracted by the feature value extraction section so as to recognize a facial image of the human recognition object.

28. (Currently Amended) The facial image recognition apparatus as set forth in claim 26, further comprising a posture guide ~~for supporting~~ which supports a hand in a state wherein the human recognition object bends one's lower back, wherein the motion picture camera photographs in an upward direction a facial image of the human recognition object in a posture in which one's hand is supported by the posture guide.

29. (Currently Amended) The facial image recognition apparatus as set forth in claim 26, further comprising a posture guide ~~for supporting~~ a hand in a state wherein the human recognition object bends one's lower back, wherein the motion picture camera photographs in an upward direction a facial image of the human recognition object in a posture in which one's hand is supported by the posture guide, and the display section is installed so that the human recognition object can look at a display screen in a state wherein the face of the human recognition object whose hand is supported by the posture guide faces downward.

30. (Currently Amended) The facial image recognition apparatus as set forth in claim 29, wherein the display section is installed so that an angle of the display screen displayed for the human recognition object with respect to the floor face becomes more obtuse than the angle of the photographing direction of the motion picture camera with respect to the floor face.

31. (Currently Amended) The facial image recognition apparatus as set forth in claim 26, further comprising an infrared light interruption section ~~for interrupting~~ which interrupts an infrared wavelength region of natural light, wherein the motion picture camera has a sensitivity only in the infrared wavelength region and photographs a facial image of the human recognition object in a state wherein an infrared wavelength region of the outer light is interrupted by the infrared light interruption section.

32. (Currently Amended) The facial image recognition apparatus as set forth in claim 31, further comprising an infrared illumination ~~for radiating~~ which radiates light in an infrared wavelength region toward the human recognition object.

33. (Withdrawn) A pass control apparatus recognizing a facial image of a passenger to control a pass of the passenger, said pass control apparatus comprising
a camera installed so that the passenger positions oneself on a floor face having at least one or more differences in elevation and photographing a facial image of the passenger positioning oneself on a floor face of a height according to the height of the passenger,
a display section for displaying a facial image of the passenger photographed by the camera,
a feature value extraction section for extracting a feature value of the face of the passenger from a facial image photographed by the camera,
a recognition section for collating the feature value extracted by the feature value extraction section with a standard feature value registered in advance so as to recognize a facial image of the passenger, and
a pass control section for controlling a pass of the passenger according to a recognition result by the recognition section.

34. (Withdrawn) The pass control apparatus as set forth in claim 33, further comprising an information input section for inputting information related to the passenger, wherein the recognition section searches a feature value corresponding to the information inputted by the information input section from the standard feature value registered in advance and collates the searched feature value with the feature value extracted by the feature value extraction section so as to recognize a facial image of the passenger.

35. (Withdrawn) The pass control apparatus as set forth in claim 33, further comprising a posture guide for supporting a hand in a state wherein the passenger bends one's lower back, wherein the camera photographs in an upward direction a facial image of the passenger in a posture in which one's hand is supported by the posture guide.

36. (Withdrawn) The pass control apparatus as set forth in claim 33, further comprising a posture guide for supporting a hand in a state wherein the passenger bends one's lower back, wherein the camera photographs in an upward direction a facial image of the passenger in a posture in which one's hand is supported by the posture guide, and the display section is installed so that the passenger can look at a display screen in a state wherein the face of the passenger whose hand is supported by the posture guide faces downward.

37. (Withdrawn) The pass control apparatus as set forth in claim 36, wherein the display section is installed so that an angle of the display screen displayed for the passenger with respect to the floor face becomes more obtuse than the angle of the photographing direction of the camera with respect to the floor face.

38. (Withdrawn) The pass control apparatus as set forth in claim 33, further comprising an infrared light interruption section for interrupting an infrared wavelength region of natural light, wherein the camera has a sensitivity only in the infrared wavelength region and photographs a facial image of the passenger in a state wherein an infrared wavelength region of the outer light is interrupted by the infrared light interruption section.

39. (Withdrawn) The pass control apparatus as set forth in claim 38, further comprising an infrared illumination for radiating light in an infrared wavelength region toward the passenger.